



cutting through complexity

KPMG GLOBAL MINING INSTITUTE

From volume to value

Cost optimization in the
mining sector

kpmg.com/mining

KPMG INTERNATIONAL

A photograph of a large-scale mining operation. In the foreground, there are massive piles of dark, granular material, likely coal or ore. In the background, a complex network of yellow metal conveyor belts and support structures extends across the scene under a clear blue sky. The perspective is from a low angle, looking up at the machinery.

Performance Series

Contents

03



04



06



10



16



Introduction

**Labor
productivity:
time is money**

**Integrated
production
planning:
achieving a
smoother ride**

**Asset
management:
staying in
control**

**Energy
management:
achieving security
of supply, the right
cost and optimal
consumption**

20

26

32

36

40



**Supply chain
planning and
inventory
management:
realizing
supply chain
efficiencies in
the mining sector**

**Shared
services and
outsourcing:
a global,
integrated
approach**

**Operating
model: a
blueprint to
deliver the
corporate
strategy**

**Information
management:
understanding
what drives
cost**

**Cost culture:
one eye on
the margin**



Introduction

In recent years of excess demand and high commodity prices, mining companies could not extract materials out of the ground quickly enough. Lesser attention was paid to cost, with the markets more concerned about scale, volume and project portfolios.

Today, with unpredictable demand, falling prices, rising costs and increasing geological complexities, profitability has become a far higher priority.

This shift in focus means that employees at all levels now have to consider whether their actions are creating business value. Building a value-based culture takes time and requires every individual to understand the impact of his or her decisions upon the individual parts of the business and mining value chain, leading to closer integration of the various operating functions.

Technology and analytical tools are an increasingly important part of the solution and can help mining project owners realize greater cost efficiencies by improving processes and providing better management information.

In the third of a series of papers on navigating the mining asset life cycle, this paper looks at every aspect of cost optimization: asset management; energy management; information management; integrated production planning; labor productivity; operating model; shared services and outsourcing; supply chain management; and last, but not least, culture, which is the glue that binds all these different activities and functions together.

Many authors of these chapters have spent a lifetime in the mining industry and offer highly authoritative insights into how the industry can achieve sustainable returns over the coming decades.

To discuss or obtain further information about any of topics mentioned in this paper, please contact the mining specialist listed or contact your local KPMG representative.

Hiran Bhadra

Global Mining Leader,
Operational Excellence
KPMG in the US



Hiran Bhadra

Global Mining Leader,
Operational Excellence
T: +1 214 840 2291
E: hbbhadra@kpmg.com



Wayne Jansen

Global Head of Mining
T: +27 11 647 7201
E: wayne.jansen@kpmg.co.za

Labor productivity: time is money

By identifying and addressing relatively small inefficiencies in worker performance, it is possible to make substantial productivity gains.



Bidyut Chakraborty

Management Consulting
KPMG in India

T: + 91 33 4403 4068

E: bidyutchakraborty@kpmg.com

Whether in an open cast or underground mine, each stage of the operation — drilling and blasting, loading, hauling, crushing, processing and the final transportation — is dependent upon incredibly tight coordination to ensure that neither costly equipment nor work teams are standing idle and unproductive.

There are a number of key indicators that determine the relative efficiency of a mine's workforce, all of which can be compared against comparative best practices in similar mines in the same or different geographies.

If a mine is not delivering its target output per man-shift (OMS), then it is likely to be running below capacity. The overall cost of manpower per unit of material extracted is a critical indicator of performance.

Although better deposits (such as geological features) and operational factors contribute to good productivity,

other company-specific or emerging industry innovations and technology advances are equally or even more important. Mining companies should, therefore, continue to seek labor efficiency improvements and monitor performance closely to ensure that labor costs per metric ton of ore extracted are within target levels.

Levers for improving labor productivity

Annual production plans determine mine-level operational plans, management structure and help define production targets and crew allocation requirements. The annual production and operational plans for a mine are, in turn, created with input from mine management and are driven by a combination of the mine extraction strategy and past performance figures,

with any readjustments carried out on a periodic basis.

Crews are sized, trained and allocated according to production targets and, where applicable, are given an early view of potential profiles based on their planned production targets. Labor unavailability and changes in blasting schedules can cause variances between planned and actual production outputs and performance is measured at both mine and crew levels, with mine productivity benchmarked through several reports and crew efficiencies recorded through the bonus system.

- **Blasting** is a particularly important activity, as the loading and hauling that follows a blast requires both people and equipment to move the loose material from the mine. If a blasting opportunity is missed, defined as a 'lost blast', for any reason, then these resources are waiting in vain at great cost, which produces a sharp fall in productivity, as measured by OMS.

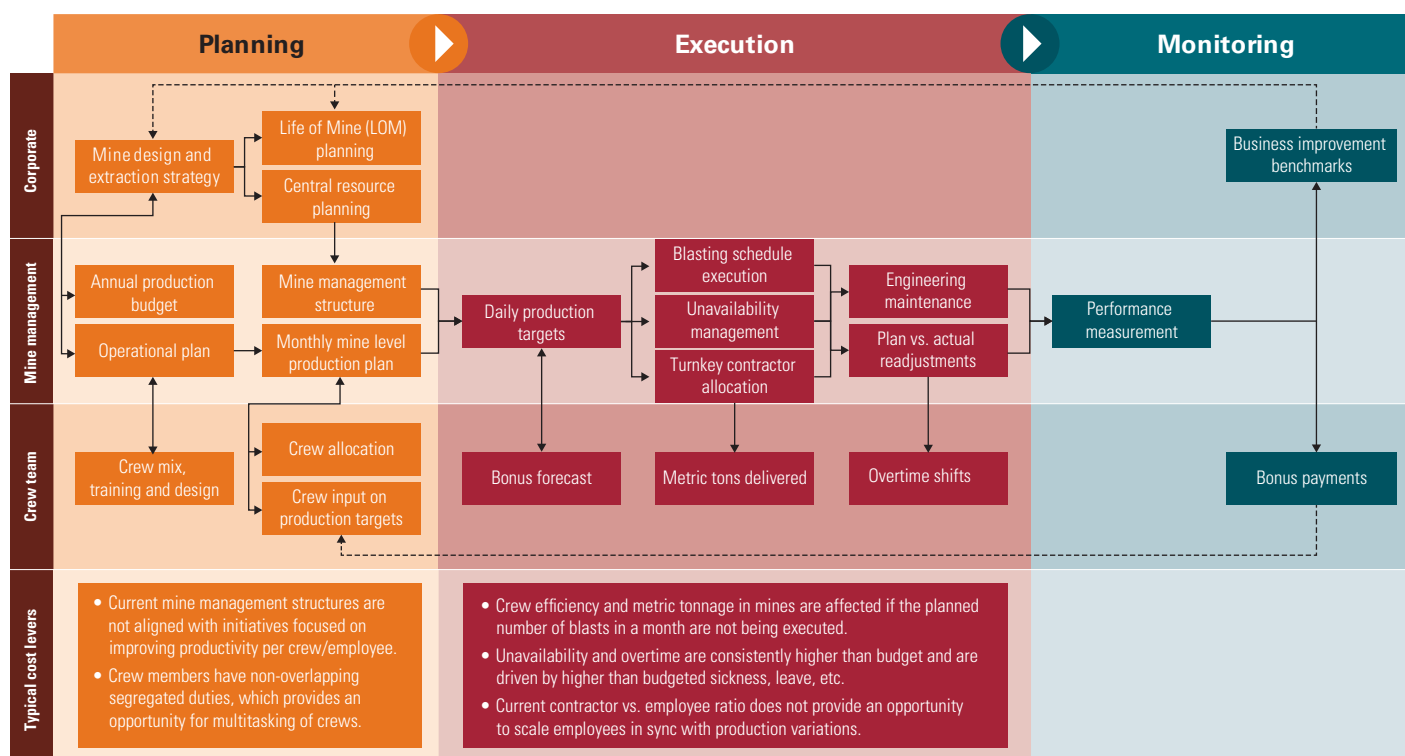
- **Absenteeism** rates can make interesting reading and high levels are often synonymous with higher costs, as an absentee typically has to be replaced at short notice, often on weekends or during national or religious holidays, when overtime rates may have to be paid. The correlation between the amount of overtime paid and absenteeism is generally strong, so these cases should be investigated to ensure that staff have a genuine reason for being off work and an absenteeism strategy can be put in place.
- At an executive level, the **mine managers** need sufficient layers of management to assume responsibility for smooth operations and safety. However, if the balance between executive and non-executive positions is wrong and/or there are overlapping/ambiguous roles for key executive positions, then there may be too many non-productive workers, which will push up costs per unit extracted.
- The mix and size of a **work crew** can also have a big impact on efficiency and safety. These teams combine drill machine operators, explosives experts to plant the explosives into the drill holes and loading machine operators who gather the rock to be transported to the surface and refined. If a crew has a surplus or shortage of any type of specialist or lacks the appropriate mix of youth and experience, then there will almost certainly be room for improvement. For example, if there are plenty of drillers but not enough explosives people, then the blasting will be delayed.
- It is important to consider the **contractor-to-employee ratio**. When a reasonable proportion of contractors perform direct mining operations, the fixed cost component of labor involved in mining operations is easier to manage, which provides flexibility to adapt to variable production levels (due to seasonal effects and/or changes in

the external business environment, including demand fluctuations, price volatility and regulatory changes).

Turning the levers

By benchmarking the performance of mine workers with peers in similar operations, KPMG's professionals can identify areas of lower productivity. We have built up a large database of results from around the world, covering every type of activity across surface and underground mines. Even where a client is meeting the industry standard, we can help set 'stretch' targets that reach for even higher levels of OMS or manpower cost per unit. We gather information through observation and interviews and can scrutinize the management structure and crew composition to ensure a well-balanced, cost-effective and productive team.

Labor productivity impacts all stages of mine management



Source: KPMG International 2013

Integrated production planning: achieving a smoother ride

By bringing the mining and processing functions closer together, miners can improve their planning to minimize downtime, reduce overtime and maintain a stable rate of production to meet market demand.

As ore moves from the mine to the processing plant, the hope is for a smooth, efficient journey, from blasting, hoisting and transporting through to processing. However, a number of factors can disrupt progress, leaving people and equipment idle and reducing the final output.

Despite being highly interdependent, the two areas of processing and mining are often not closely aligned, with separate management teams, budgets, cost centers and performance targets and relatively little communication between each other. Processing plants are keen to ensure a steady flow of ore to keep their crushers rolling 24/7, yet mines often fail to deliver.

A lack of synchronization between planned stoppages in either mines and/or processor stoppages is often to blame. For example, mines may have to stop to carry out yield measurements and typically shut down for public holidays. Unplanned maintenance can also halt the flow, while inaccurate production forecasts are a further

cause, with actual volumes falling short in some known instances by as much as 10 percent.

Ore backlogs at processing plants have a similar impact to a crash on a motorway, causing a 'traffic jam' that may reach all the way back to the heart of the mine. Processors can also be held up due to shortages of ore, often caused by undersized storage tips in front of the plants, which often contain less than two days' supply. All it takes is unplanned downtime in mining — possibly due to industrial action — for this supply to quickly run out.

The impact of these backlogs can be felt at every stage of the mine's internal value chain.

Lost blasts: When ore becomes backlogged, the silos outside and within the mine fill up, leaving no space to lay dynamite. Alternatively, the work areas require cleaning after storing excess ore. Both of these factors can prevent blasting, leaving expensive equipment and workers standing idle.



Jon Richards


Strategy Group
KPMG in the UK

T: +44 20 7311 3353

E: jon.richards@kpmg.co.uk



“Processing and mining are often not closely aligned, with separate management teams, budgets, cost centers and performance targets.”



“Integrated production planning brings together the mining and processing functions to create greater efficiency.”

Overtime in hoisting and tramping:

To clear backlogs of ore around the mine, the complex hoisting equipment — and the vehicles that transport the material — often need to be run by workers on overtime, pushing up costs.

Reduced time available for maintenance:

With equipment and vehicles being used consistently for overtime, there is less essential maintenance, which can lead to breakdowns or accidents.

Material rehandling: When silos inside and around the mine reach capacity, ore must be moved to temporary stockpiles and additional trucks (known as ‘yellow plant’ transporters, such as dozers or wheel loaders) are required to move the materials at considerable expense, with costly overtime rates for the drivers.

Trains waiting to load or unload:

A combination of unsynchronized schedules and full tips outside processing plants can leave trains waiting to unload. Conversely, a lack of ore at the mine (due to missed lost blasts or holidays) can mean that trains stand idle and empty.

Processor stoppages: A shortage of ore can force processors into unplanned shutdowns.

Inefficient processing: Fluctuations in the quantity of ore supplies can leave processors short of sufficient volumes to keep the plant running, forcing them to bolster the ore with waste. Processors need to operate within optimal bands of throughput; erratic supplies of ore force them to go above or below these levels, making them less efficient. Consequently, they consume excess chemicals and reduce their yields.

Excess capacity in processing plants:

Unpredictable spikes in supply may result in processors having to maintain a higher capacity than necessary. When supply falls, part or all of the processing plant may have to be shut down, at considerable cost.

Towards greater integration

None of the above issues are necessarily new to mine operators, but many struggle to quantify their precise impact in terms of additional costs, lower productivity and squeezed margins. Through detailed observation and analysis, it is possible to size the impact of lost blasts, overtime, increased use of plant or equipment and hoists, idle equipment and people,



unplanned stoppages and excess processor capacity.

Integrated production planning brings together the mining and processing functions to create greater efficiency through better governance, planning, communication and execution, viewing the mine's value chain as a single system. By developing new performance measures that drive appropriate behavior, all areas of the mine should follow shared targets and work towards similar goals.

Some potential 'quick wins' include maintaining appropriate sized stockpile levels at different stages, including a centralized stockpile and appropriate sized tips outside processing plants, and increasing the capacity of silos within the mine.

Greater synchronization of long- and short-term production plans and closer communication should help to achieve better forecasting, leading to a smoother and more predictable flow of ore and more efficient use of assets. Working together in this way should also lead to a more adaptable, flexible approach, where an incident such as unexpected downtime in a plant has a quick, decisive response, with ore production swiftly diverted to a different processor. Scenario models can also be built to predict and overcome the impact of fluctuations in production, with greater automation to replace manual, spreadsheet-driven practices.

Sizing the challenge

KPMG's mining professionals have deep experience advising on key operational challenges faced within the mining sector. Having worked on a variety of mines around the world, our firms measure the financial and productivity impact of inefficiencies and challenge clients to take a more holistic approach, viewing the mining and processing operations as a single process.

Asset management: staying in control



Niladri Bhattacharjee
Management Consulting
KPMG in India
T: +91 33 4403 4020
E: niladri@kpmg.com

Whether outsourcing maintenance or keeping it in-house, mining companies need to service their assets effectively, respond quickly to incidents and mobilize spare parts swiftly.



With daily operations costing millions of dollars, ambitious production targets and hugely expensive equipment and machinery, mining companies need to get the most out of their assets to minimize shutdowns or idle time.

Mines contain a combination of owned and leased assets, with fixed equipment more likely to be managed and maintained in-house and mobile equipment often owned by the contractor. Regardless of who controls the assets, maintaining a clear view of their performance can make a big difference to the smooth running of the mine and keep costs down.

The asset ownership strategy

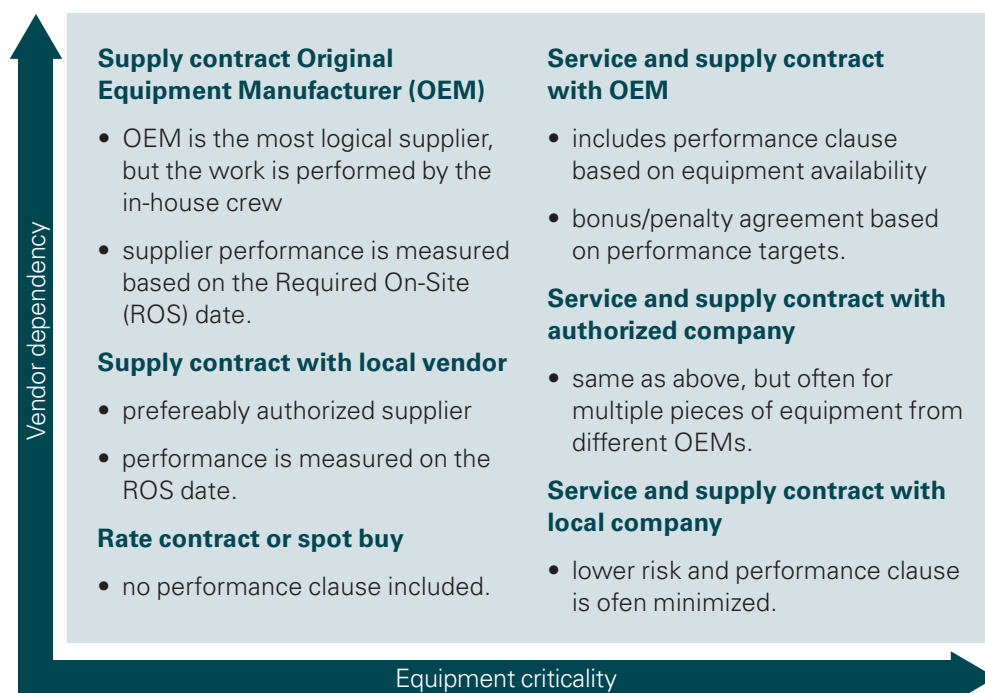
As a first step, mine owners should set out the type and volume of equipment required to deliver desired production

levels, with targeted running hours that determine the percentage utilization of this equipment on a daily, weekly and monthly basis. Maintenance equipment such as dozers and motor graders keep the haul roads around the mine in good condition and typically have lower target utilization levels. Dump trucks, shovels, excavators, water sprinklers, mobile cranes, mobile light towers, explosive vans, mobile crushers and truck scales all contribute relatively directly to production and are therefore expected to be in operation for a higher proportion of time.

If a large asset is very expensive and only made by a few global vendors, or if it is only needed for a relatively short period, then leasing may be preferable. Where the equipment is produced by a greater number of manufacturers, particularly local businesses, competition may push prices down, making it cheaper to buy.

“Maintenance equipment such as dozers and motor graders keep the haul roads around the mine in good condition and typically have lower target utilization levels.”

Maintenance strategies based on criticality and vendor dependency



It is important to undertake the criticality-cum-vendor dependency analysis for each key equipment category to choose the right maintenance strategy

Source: KPMG International 2013



“

Availability of spares could influence the buy/lease decision, as a lack of access could convince a mine to take out a comprehensive leasing contract that includes full servicing.”

In any case, business models have evolved and OEMs have started leasing out equipment and even offer equipment along with their operations and maintenance as a package. Driven primarily by the interplay between cost of labor and cost of fuel, the mechanics of asset management and asset maintenance will continue to evolve.

Contractor management

When it comes to servicing, maintenance and supply of spare parts, mining companies can take responsibility themselves, outsource these activities to a dealer or manufacturer or choose a combination of the two. Contracts typically specify an agreed level of availability for the

equipment, with rewards or penalties for meeting and/or not meeting targets.

A supply-only purchase contract enables local contractors to carry out the maintenance and is a popular choice for less critical equipment. Availability of spares could influence the buy/lease decision, as a lack of access could convince a mine to take out a comprehensive leasing contract that includes full servicing.

In a higher cost country such as Australia, it may be too expensive to employ a full-time team of repair technicians such as mechanics, welders and electricians, so most of the maintenance and the operations will be outsourced. When mines are in remote locations, there are fewer vendors in close proximity, so the owner may have to open a workshop on-site.



Maintenance infrastructure

Punctual servicing and fast response to breakdowns require fast mobilization of the right support equipment and spares. Maintenance infrastructure consists of a workshop(s), a store for spares and mobile equipment for field maintenance, all of which may be kept centrally or at field level.

Maintenance can be separated into three categories: minor, medium and repairs. Minor maintenance is predominantly carried out by an operations team or by external providers performing tasks such as checking filters and lubricants and replacing tires. Medium maintenance includes responding to incidents in the field, such as a crusher failing during a

nightshift, and demands more advanced, technical skills, along with mobile maintenance trucks that can quickly get to any point of the mine to keep essential equipment active.

Repairs that are more complex and time consuming would usually be performed in a centralized workshop.

The quality of operations tends to determine what kind of maintenance oversight is required. For instance, lack of proper illumination during night shifts can cause accidents and damage, so the installation of appropriate lighting helps truck drivers see the road more clearly and reduce the chance of such incidents. Overall, good operating practices enable a leaner on-site maintenance infrastructure.

“Mine owners, therefore, need good monitoring mechanisms to confirm that equipment is treated and maintained adequately and that appropriate practices are followed.”

Spare parts management

Spare parts are stored either for general maintenance and wear and tear or for repairs in the event of a breakdown. When maintenance is outsourced, the manufacturer or dealer is responsible for ensuring that the equipment is cleaned and serviced regularly and will maintain entire subassemblies at the mine at its own cost. For instance, in cases of engine failure, the entire engine transmission assembly may be taken out and replaced temporarily while the fault is being rectified at the workshop.

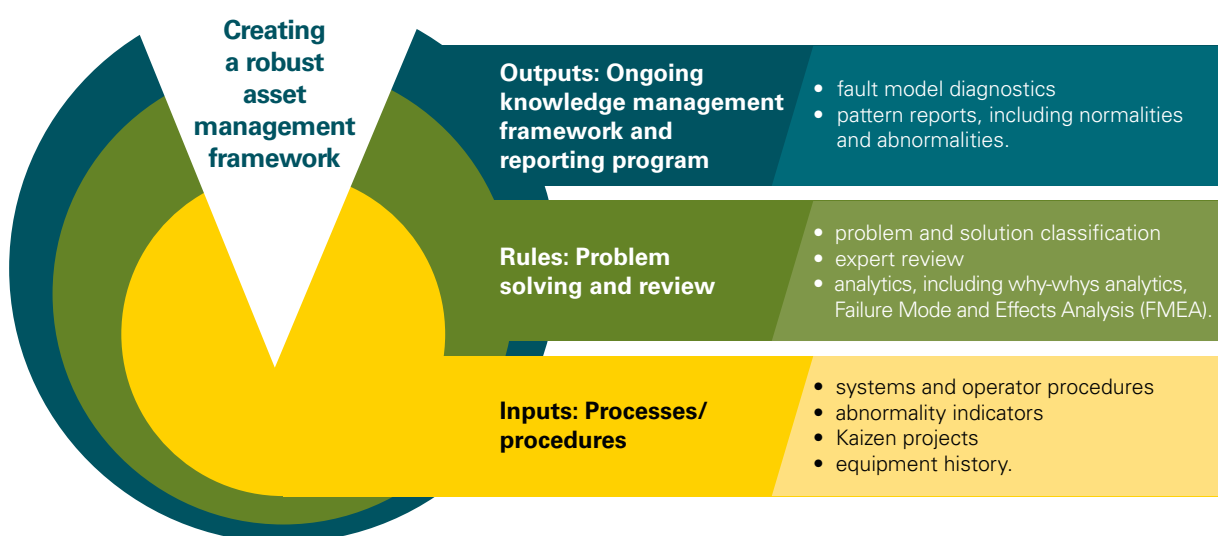
Although operational contractors will use their own equipment, mine owners still want to oversee their operations, both to ensure smooth, continuous operations and to satisfy regulatory requirements. For example, in some countries it is mandatory to have a camera mounted on the rear of dump trucks to give drivers a better view, along with proximity sensors that track objects close to the vehicle. Further standards apply, relating to safety and pollution.

Some contractors may ignore these standards, either deliberately to save money or through negligence. Reckless use of a shovel, for example, could cause damage that will reduce its effectiveness and lead to greater energy usage, pushing up costs. Mine owners, therefore, need good monitoring mechanisms to confirm that equipment is treated and maintained adequately and that appropriate practices are followed. Further details on monitoring can be found in the next section.

Maintenance execution

The type of maintenance schedule can vary from mine to mine. Some choose a time-based approach, with service every three months or so, while others prefer to carry out essential maintenance based upon usage, which, in the case of a dump truck, would occur when a certain mileage has been reached. Others, again, elect to carry out ‘condition-based maintenance’ only when a potential fault is predicted, while a fourth option, called ‘preventive maintenance’ sets

Creating a robust system



Source: KPMG International 2013

specific dates for reviewing and servicing the most vulnerable parts. This latter approach often leads to a major and extremely costly overhaul.

Companies wishing to keep a tight leash on working capital tend to favor condition-based maintenance, as it limits expenditure to equipment and components that urgently need attention. However, such condition monitoring also requires investment in instrumentation technologies in order to 'sense' various parameters and enable analytics tools to collate and plot vibrations, temperature and speed per minute. These analyses indicate how close equipment is to failure.

By analyzing failures over time, it is possible to build a rich database of symptoms and causes, enabling maintenance teams to spot problems more quickly and predict breakdowns in advance, which improves utilization rates, increases productivity and reduces repair costs. This data can be fed back to manufacturers of equipment and spare parts to improve longevity, minimize faults and make design improvements. Companies also measure the effectiveness of different maintenance regimes and the average time between failures to identify the optimal level of servicing frequency necessary to keep the mine operational.

Over time, these advances have helped evolve Reliability Centered Maintenance (RCM), with SAE International codifying process standards under SAE JA1011. This methodology first emerged in the airline industry, which has exacting standards of safety, yet remains highly competitive with tight budgetary controls.



Keeping the show on the road

With experience working on some of the world's largest mines, KPMG's Asset Management professionals, utilizing appropriate analytics, can help member firm clients with every stage of maintenance, from planning to execution, to minimize any disruption to their operations. Our professionals can help put in place processes for monitoring assets to give mining companies more control over their performance. This may include determining the ideal size and location of workshops, range and nature of spare-parts inventory, type of maintenance schedule and deciding whether to contract out servicing or keep it in-house. Much of our firms' work is founded on an analytical framework with a rigorous way of streamlining decision-making on maintenance issues.

Energy management: achieving security of supply, the right cost and optimal consumption

By achieving an uninterrupted flow of energy, mines can save hundreds of millions of dollars a year. And through intelligent use of peak and off-peak demand, as well as efficient fuel management, they can cut their energy bills substantially.



Harmeet Katari
Management Consulting
KPMG in South Africa
T: +27 11 647 7111
E: harmeet.katari@kpmg.co.za



Electricity and fuel account for between 50 to 70 percent of a mine's operating costs, with the most energy-intensive activities being blasting, excavation, haulage, ore processing and ore logistics.

Faced with increasing price volatility and scarcities of coal and fuel, mining companies are rethinking their energy management strategies, concentrating on three areas:

- supply security
- electricity demand management
- fuel management and efficiency.

Supply security

Many emerging countries are struggling to meet growing demands for energy, even when they have large coal reserves, which results in frequent load shedding. Rising electricity prices only add to the problem. Most new mining developments are located in remote locations where electricity supplies are limited. In response, larger players are looking at alternate sources of energy to ensure steady supplies.

A recent study, by KPMG US and KPMG India combined, with a focus on long-term energy reliability in Africa revealed that a lack of supply could lose a mining company between US\$100 and US\$400 million over 5 years. The study went on to evaluate alternate sources of captive power, as shown in the following diagram:

An energy reliability comparison

	Natural gas/ liquefied natural gas (LNG)	Coal	Volta River Authority (VRA)	Light cycle oil (LCO)	Diesel	Crude fuel oil (CFO)/heavy fuel oil	Renewable/ municipal solid waste (MSW)
Cost competitiveness¹ (USc/kwh)	15-16 ²	16-17	18-19	20-21	39-40	20-21	19-20
Price certainty (relative standard deviation)	More volatile compared to coal and other petroleum products, but price can be hedged in commodity markets as futures are regularly traded.	Less volatile compared to natural gas and other petroleum products.	Uncertainty about tariff principle. Tariff negotiated on a year on-year basis with no long-term formula or principle in place.	More volatile compared to coal and crude, but price can be hedged in commodity markets as futures are regularly traded.	Price correlated with that of crude and can be hedged in commodity markets as crude futures are regularly traded.	Price correlated with that of crude and may be hedged in commodity markets as crude futures are regularly traded.	Over 80 percent of the generation costs are fixed costs, hence the volatility of the cost of electricity is expected to be low.
Availability	Development of an LNG unloading facility would secure availability of natural gas.	Sufficient quantity is expected to be available in the Atlantic market.	Capacity additions (if realized) both by VRA and independent power producers (IPPs) would enable the supply to meet or exceed the demand until 2017.	Sufficient quantity is expected to be available in the global crude market.	Sufficient quantity is expected to be available through imports.	Limited domestic quantity available; in the long term, the availability is expected to fall as consumption of petroleum products shifts to middle distillates.	Potential capacity of MSW-based generation is limited by availability of feedstock (up to 15MW in Kumasi).
Supply reliability	Uncertain supplies from Nigeria. Supply from domestic fields and an LNG facility would make supply more reliable.	While supply chain may be subject to disruptions, inventory across the value chain provides a buffer that would mitigate disruptions and ensure reliability.	Increase in share of thermal (base load) capacities might increase the VRA supply reliability.	LCO supply subject to availability of port capacity and any disruptions in port operations.	Transportation of large quantities of diesel may be limited in next 3 to 5 years. Coastal generation is feasible but may increase costs with no additional advantage.	Same as diesel. CFO/heavy fuel oil may require separate supply infrastructure (heated).	Power generation is subject to disruptions in waste collection, transport and processing.

Source: KPMG International 2013, Recent KPMG study for evaluation of different sources of captive power for a leading mining company with assets in Africa.

“Electricity providers offer a range of tariffs, with prices rising during times of peak demand during the day, as well as during different seasons.”

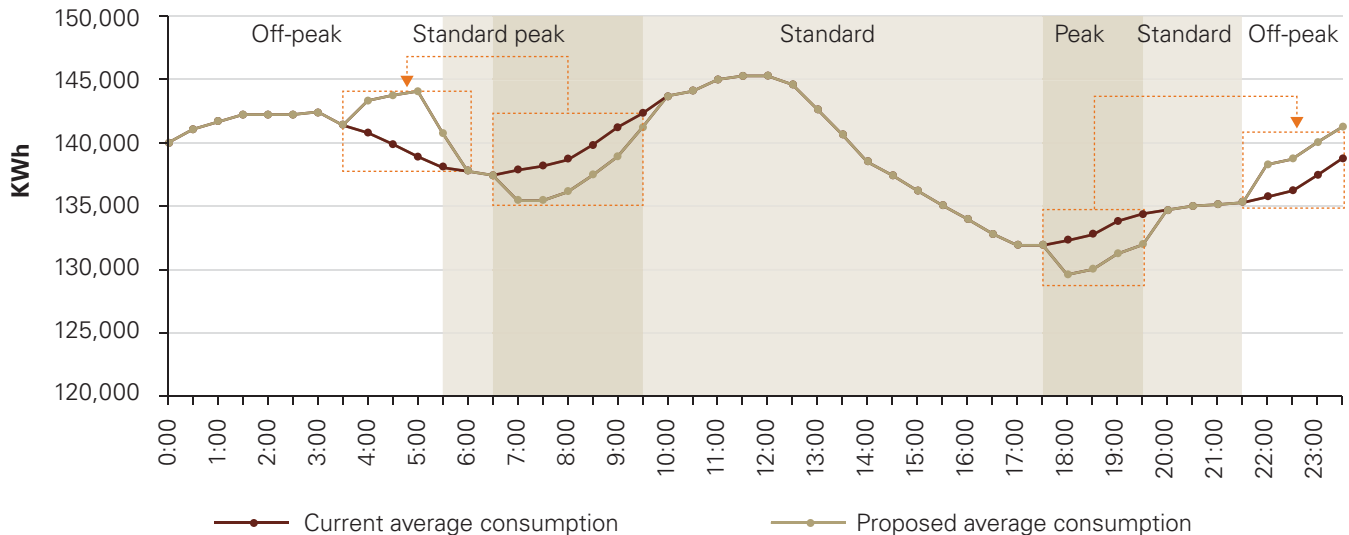
Electricity demand management

Electricity providers offer a range of tariffs, with prices rising during times of peak demand during the day, as well as during different seasons. This demand is reflected in peak daytime, evening and weekend rates and significant savings can be achieved by organizing maintenance shutdowns to coincide with the peak tariff periods and carrying out the most power intensive activity during the non-peak times. Managing peak loads in this way can trim three to five percent off the energy bill.

Mining companies can also reduce energy costs through power factor correction and peak demand management, as well as the use of energy efficient variable frequency drive motors in pumps in the mine and processing plants.

In deep shaft mining, temperatures are kept to safe working levels through refrigeration, which uses up large amounts of electricity. In some cases, the mine temperature is actually lower than necessary, so by continually checking temperatures, the refrigerators can be set at an optimum level, which should reduce the use of electricity.

There is opportunity to consume more electricity during off-peak times with little disruption to the overall site



Source: KPMG International 2013, KPMG Analysis of before and after demand management improvement program for a mining company in South Africa.

Fuel management and efficiency

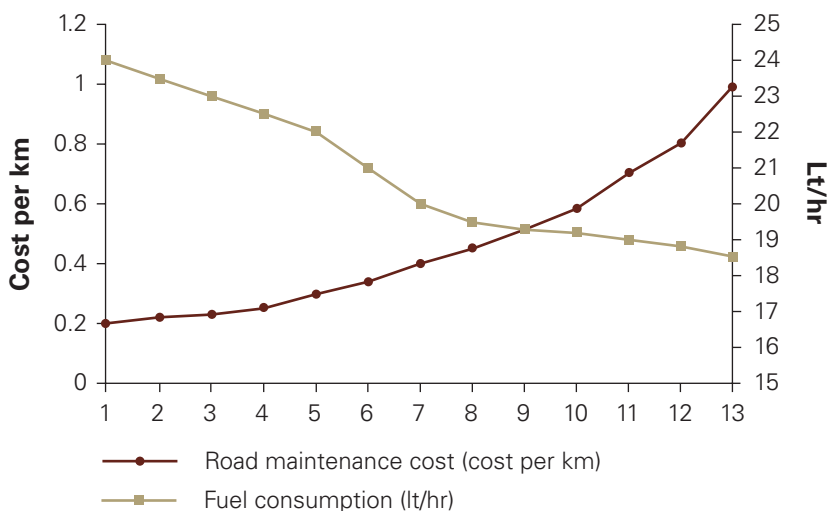
Open cast mines use huge amounts of fuel for trucks, shovels and other mining equipment and pilferage or inefficient consumption can push up the total cost of operations. Leading mining companies are implementing advanced technologies, such as fuel management systems, and entering

into third-party contracts with fuel providers, where payment is linked to fuel consumed rather than fuel delivered. Fuel management systems can track the exact volume delivered and monitor dispensing and usage on a real-time basis for all equipment.

Poor maintenance of equipment, particularly trucks, is a further source of inefficiency that pushes up the fuel costs per kilometer traveled. Engines and fuel systems require

regular maintenance to ensure they are all in good condition, with checks on lubricants, tires, oil filter and other components. Roads within mines are temporary and keep shifting as the mine face changes. New roads are continuously developed and must be maintained. Mining companies have a constant trade-off between the costs of maintaining a road versus the fuel efficiency achieved through a well-kept road.

Maintaining fuel efficiency



Source: KPMG International 2013, KPMG Analysis for a dumper in an open pit mine in Indonesia

Supply chain planning and inventory management: realizing supply chain efficiencies in the mining sector

Most of the large multinational resource companies have been on a formal supply chain management (SCM) journey for the past decade where processes and organizational structures were put in place to drive down the total cost of ownership (TCO) of their major supply chain commodities. Strategic sourcing brings greater discipline and harnesses further efficiencies into the procurement process and it helps companies leverage the range, volume and cost of goods purchased. Closer collaboration with suppliers can make inventory optimization more efficient, secure future stock requirements and stimulate product innovation.



Chris Van Der Merwe
Management Consulting
KPMG in South Africa
T: +27 82 718 3579
E: chris.vandermerwe@kpmg.co.za

In recent years, most major mining companies have adopted a more strategic approach to sourcing based around the total cost of ownership (TCO), with a more centralized supply function, a standardized, rationalized list of products, equipment and services across the organization and a smaller number of preferred suppliers. To gain a more holistic view, supply chain professionals have grouped expenditures into defined categories of capital equipment, consumables and services, with subcategories such as tires, conveyor belts and drill bits.

In an environment where the low hanging fruit of supplier rationalization and product consolidation were exhausted, the big question is: "How to harness further efficiencies in a mature supply chain management (SCM) environment?"

In this mature environment, KPMG is of the opinion that two key levers will unlock additional value from SCM, namely strategic sourcing and inventory optimization. These will be further examined focusing on specific areas of potential.





“Performance management for suppliers is seldom used within the context of the contract management to ensure maximum supplier performance in a pain-and-gain relationship.”

Strategic sourcing

In the mining industry, a further complication is added to manage the supplier base due to the long-term nature of mining projects and operations, allied with the scale of equipment, materials and services purchased, which creates a unique interdependence between buyers and suppliers. With only a handful of global giants supplying specific categories, mining companies have few alternatives should prices rise, as they cannot afford any delays in their extraction and production processes. Conversely, in such a specialized market, with relatively few players, a switch to a new supplier can have devastating consequences for the previous incumbent.

1. Contract management and performance management

Management of a commodity contract over its life cycle remains a critical value

driver. Given the potential swings in the balance of power, clients are keen to build mutually beneficial relationships with the suppliers where they can gain excellent value without jeopardizing the supplier's business. Performance management for suppliers is seldom used within the context of contract management to ensure maximum supplier performance in a pain-and-gain relationship.

Suppliers are being given a more involved role in their clients' businesses in a bid to bring down consumption rates and achieve more favorable prices. The motive for their involvement is the protection of market share and forging of sustainable relationships. Having apportioned purchase volumes across a small group of suppliers, mining companies should set performance targets in order to raise quality, innovation and service. Those suppliers with a lower proportion of business have the opportunity to gain a greater allocation if they can outperform their peers.

2. Multiple contract alignment

Over time, multiple agreements are often established with suppliers across the different operating units. We have identified opportunities in client engagements where the alignment of the contract conditions of the various fragmented contracts yield considerable savings through the internal benchmarking of these. This is often prevalent in larger businesses with multiple commodities, geographically diverse operations and decentralized responsibility for establishing contracts.

3. Dynamic situation and market intelligence

In a volatile macroeconomic environment, the assumptions that drive a procurement strategy are changing more often than businesses are used to. For this reason, an opportunity exists to regularly test the market in the different commodities

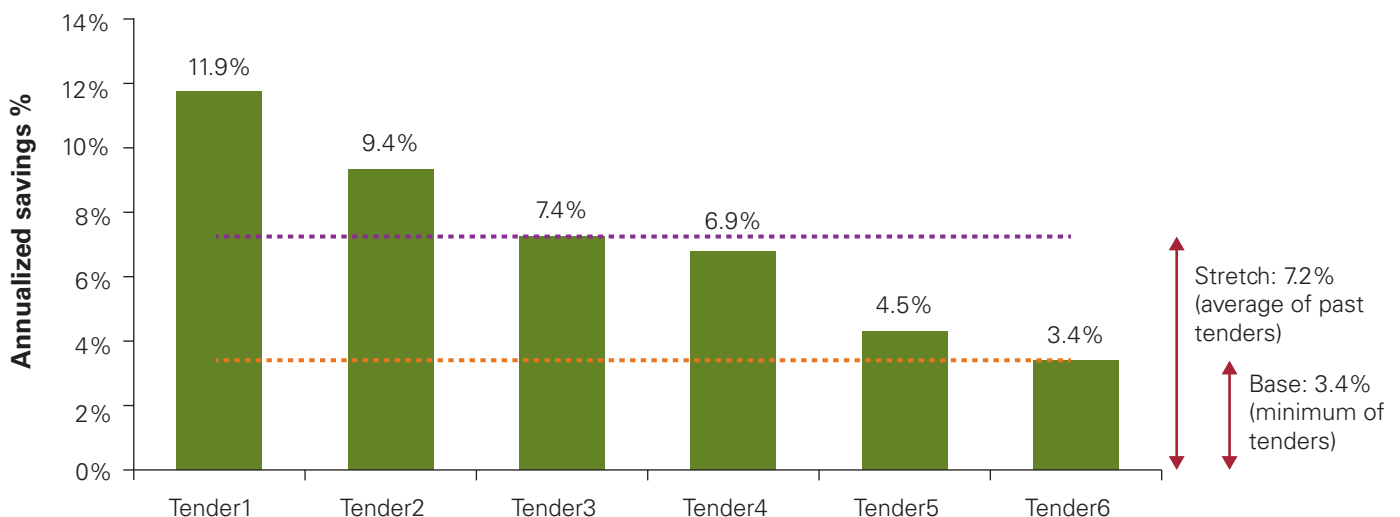
to update established benchmarks. The drive to establish long-term beneficial supplier relationships should not be to the detriment of reducing prices over time in real terms.

4. From category management to procurement alliances

The focus of most mining houses has been to establish category management of goods and services across the business by consolidating spending across various operating units. As mining commodities are geographically situated in particular regions (e.g. coal or platinum), a further opportunity exists to consolidate spending in an industry across companies and/or competitors through procurement alliances. As this was accomplished in the fields of health and safety, government relations and labor relations, an opportunity exists for collaboration to benefit all participants.

“The focus of most mining houses has been to establish category management of goods and services across the business by consolidating spending across various operating units.”

Contracts^(a) which have performed price discovery in the last 3 years have resulted in a range of savings, which would not have been realized without the tendering process.



Source: KPMG South Africa 2013

“The SCM demands information used for decisions of re-ordering, which is often inaccurate due to the silo approach between SCM and end user in terms of stock management.”

Getting the right inventory levels

Three areas of opportunity exist in optimizing inventory levels and the impact on pricing:

1. Qualify demand

The SCM demands information used for decisions of re-ordering, which is often inaccurate due to the silo approach between SCM and end user in terms of stock management. The focus of the SCM function will be up to the release of the stock to the end user as per the enterprise resource planning (ERP), whereas the focus of the end user is up to the point of consumption. As a result, there is a difference between the spend as measured in the ERP versus the real-time usage of the material. The optimization opportunity for the business is to qualify demand correctly according to the usage profile.

Often, suppliers hold a vast amount of knowledge about their customers. If they are selling to a mining company with several operating units, they may have a better picture of the various stock levels (officially and in squirrel stores) than the customer and may be able to advise on volumes of future purchases by forecasting demand.

2. Pulling stock backwards

Whereas an operational manager's biggest fear is to be out of stock, suppliers prefer smooth, continuous demand levels that avoid peaks and troughs in their own production processes. This can be achieved by taking greater control over the mine's inventory, possibly in the form of

consignment stock that is owned by the supplier but located on the buyer's premises, with each of the mine's functional managers invoiced for the materials or parts they use.

Not all production and engineering managers want to concede such a level of control, preferring to create their own distribution hubs, although this can also lead to higher than necessary stock levels as they may lack the necessary forecasting skills.

Internally, those responsible for managing the supply chain are trying to manage the expectations of operations teams who want to keep high inventory levels to avoid running out of stock, even though this pushes up costs.

3. Shared service and the payment cycle

Procure-to-pay – the period from point of order to final payment – is a vital element in the buyer/supplier relationship, as it determines the supplier's cash flow. A number of factors can cause companies to pay too late, including an unapproved purchase order, a delivery note that has not been properly captured or a disagreement over the size and specification of an order.

Suppliers try to build a safeguard into this process by offering discounts for early payment and/or penalties for going beyond the specified period. For buyers, late payment typically means higher costs and a more fractious relationship with suppliers, so they should ensure that their systems record every stage of the transaction and that all orders are thoroughly checked.

Investing in success

An increasing number of mining companies are employing supply chain specialists to manage specific categories of commodity, analyze usage and demand and rationalize the range of items purchased. With a combination of analytical, commercial and technical mining skills and knowledge, these individuals are working with suppliers to agree to pricing and technical specifications, set and monitor performance goals, and encourage product innovations that will improve the efficiency of the

mining operations and drive down the cost of each consumable per unit of production. The empowerment of these individuals to make decisions across multiple sites is an indication of the SCM maturity of the business as a whole and an enablement of continuous improvement.

A fully engaged supplier, on the other hand, is aware of the operational challenges facing the customer, knows exactly how its products are performing by gathering feedback and is committed to a long-term commercial and personal relationship in which both parties can thrive.

The complete picture

KPMG firms' supply chain and inventory management expertise has been gained from working with many of the world's leading mining companies, as both advisors and practitioners. Our firms understand the operating environment within mines and can help their clients take a fresh perspective by looking at every aspect of their procurement and stock management. This includes interviewing suppliers to gauge their views and satisfaction levels. We realize that good procurement is about much more than price and assess the consumption and production levels to achieve greater efficiency, reduce TCO and improve overall profitability.



Shared services and outsourcing: a global, integrated approach

A global, integrated approach to shared services not only cuts costs, but also helps mining companies improve productivity and adapt more quickly to changing market conditions.



Fabiano Lopes

Management Consulting
KPMG in the US
T: +1 214 840 6419
E: flopes@kpmg.com

The mining industry has traditionally taken a relatively conservative view towards shared services, which is a legacy of the days when commodity prices were high, organizational structures were simpler and efficiency was lower on the list of priorities. In the past decade, however, growing price volatility, rising costs of materials, people and equipment and stagnant demand have put pressure on margins.

During the same period, rapid consolidation has created global giants with a mass of decentralized support functions scattered across the world,

limited standardization and little use of common ERP systems. Subsequently, the costs of human resources (HR), information technology (IT), procurement and finance and accounting differ greatly by region, with excess duplication and lack of scale inhibiting efficiency and quality of service.

Although outsourcing is common, it tends to be on a local or regional basis and is often inadequately managed, with a lack of attention to performance, resulting in patchy service and, in some cases, a failure to even reduce costs.



A broader shared services and outsourcing strategy entails a journey that ultimately results in savings, excellent service, efficient

processes and a more adaptable organization, yet most mining companies struggle to get past the first of four key stages, which are:

Service delivery options

	Decentralized			Partially integrated shared services outsourcing (hybrid)			Business services organization			Integrated business services organization (IBSO)		
Delivery model options	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit	Legal entity/ business unit
	HR	HR	HR	HR			HR	HR	HR			
	F&A	F&A	F&A	F&A – Regional SSCs with BPO		F&A	Other			IBSO governance		
	IT	IT	IT	IT	IT and HR – Regional SSCs with ITO		F&A	Standalone services organization			Global SSCs	
	Proc.	Proc.	Proc.	Proc.– Global SSC with BPO			IT	Regional SSCs	CoEs	ITO	Regional SSCs	
	Other	Other	Other	Other	Other	Other	Proc.	Global SSCs	BPO (F&A, other)		BPO (F&A, HR, Proc., other)	
Definition	No enterprise-wide service sharing across the legal entities/business units. Each legal entity/business unit has its own selling, general and administrative (SG&A) functions, resulting in duplicative processes across the enterprise.			Some sharing of services across each legal entity/business unit, but each function decides on the service delivery resulting in disparate service delivery arrangements (i.e. captive vs. hybrid, business process outsourcing).			Established standalone business organization across most legal entities/business units with some functions as part of the organization. End-to-end processes are bundled across single functions.			IBSO across all legal entities/business units with joint governance framework and extended across multiple functions. End-to-end global processes are bundled across multiple functions with process ownership and accountability.		
Benefits of model	<ul style="list-style-type: none">• model facilitates divestitures• functional spin-offs possible• effective model for market-specific, high-touch services, wide variance for knowledge-intensive, enterprise-wide or infrastructure-intensive services.			<ul style="list-style-type: none">• functional spin-offs possible, but with diluted economies of scale• facilitates market-specific, high-touch services.			<ul style="list-style-type: none">• greater savings potential, particularly if offshore locations considered• high agility if technical platforms and integrated data are consolidated and outsourcing relationships include virtualized platforms.			<ul style="list-style-type: none">• high cost reduction potential• high agility if shared services center and outsourcing relationships have been fully consolidated across markets.		

Note: The scenarios that increase efficiency and agility will require trade-offs in the level of local touch offered by certain functional areas.

Source: KPMG International 2013

• Decentralized model

Companies take small, tentative steps towards sharing services by introducing standard processes for small elements of various support functions on a country-by-country basis (such as compensation and benefits or payroll). These centers act independently, with little or no central control, meaning that there is still considerable duplication of effort.

• Partially integrated model

Some parts of individual support functions become centralized (e.g. compensation and benefits within HR),

treating the various country businesses as their 'customers', with staff possibly located in offshore locations that may or may not be outsourced.

• Shared services model

At this more advanced stage, the various activities and processes for a particular function are consolidated to a regional shared service center that operates as a separate business. Some functions go truly global, possibly with regional hubs and a balance of internal and outsourced provisions.

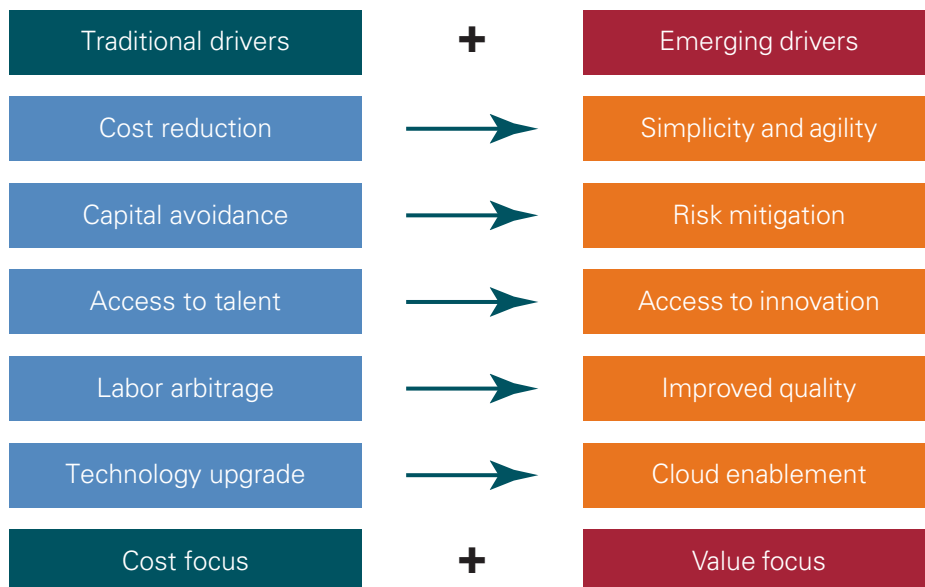
• Integrated multifunctional global business services model

The ultimate goal of a multinational mining company is to have a fully integrated set of support functions, managed as one single group of businesses, with global accountability and a mix of in-house and outsourced providers. This group works to robust service level agreements, with rewards and penalties for meeting/

missing performance targets and ongoing checks and balances to maintain a consistent level of service. By liaising closely with the customer, the shared services group can fully understand the organizational strategy and come up with innovative new ways to support the business. Transfer pricing ensures that all users are charged appropriately.

“By liaising closely with the customer, the shared services group can fully understand the organizational strategy and come up with innovative new ways to support the business.”

Shared service value proposition is shifting from a cost to a value focus in mature shared service organizations



Source: KPMG International 2013

Setting a roadmap

Before considering which functions to move to a shared service and/or outsource, mining companies need to be sure that these changes are in line with their wider business strategy. The initial planning phase quantifies existing costs and potential benefits and determines the types and scale of HR, finance and accounting, IT, procurement, technical and other services necessary to support business growth.

Having set a shared services strategy, the new organizational structure and processes should be designed, along with a governance structure that sets out a procedure for managing the relationship between supplier

and customer, with clear targets, procedures for tracking performance and appropriate rewards and penalties. Also, the governance structure needs to consider a process that allows for a self-feeding mechanism focused on process improvement and innovation.

It is vital to arrive at the appropriate balance between in-house and outsourced shared services. Outsource too much and the organization may lose important core competencies; outsource too little and it could be missing out on potential cost savings. The location of new outsourced partners will also be influenced by factors such as wage costs, ease of doing business, tax and regulatory environment and IT, transport and economic infrastructure.

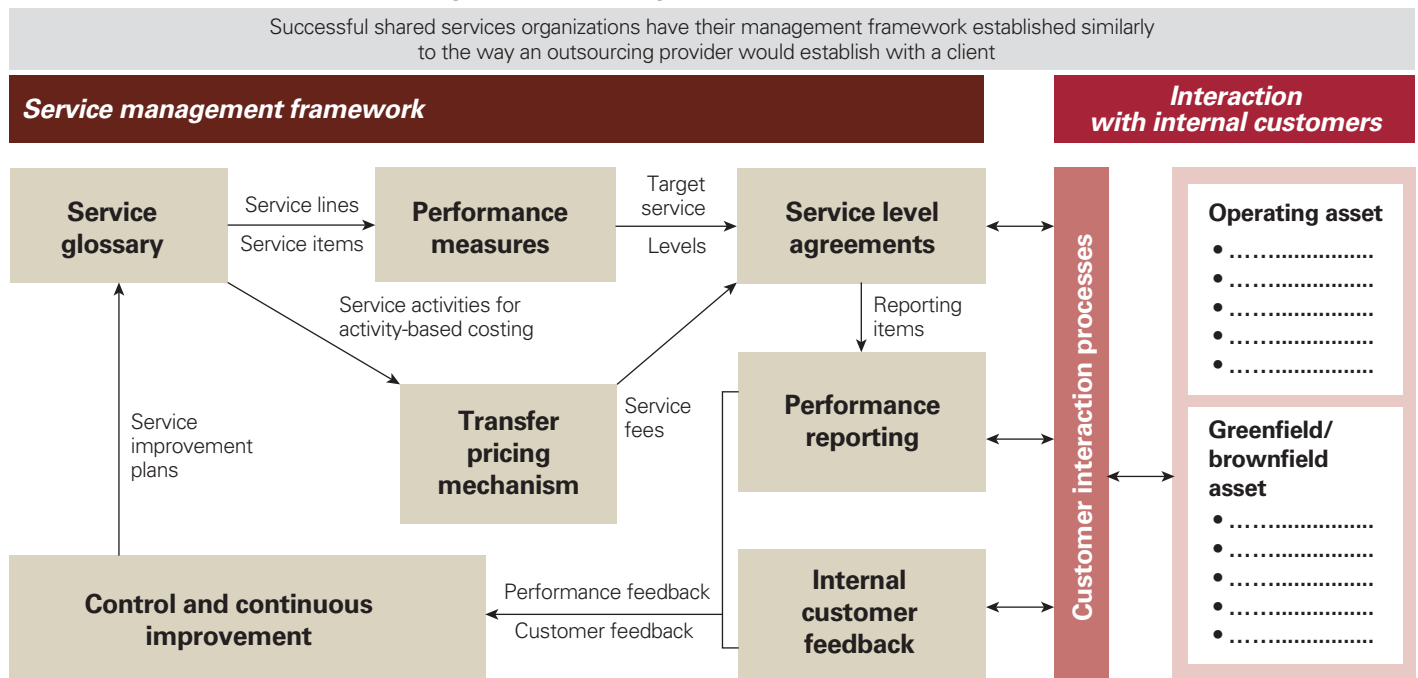
Once an organization has identified which components will be outsourced and which will be kept in-house, searching for and selecting potential suppliers is a big challenge, in order to find the right match in terms of location, capacity, capability and culture. The tender itself is a very specialized process, as mining companies strive to produce a clear, comprehensive request-for-proposal, manage negotiations tightly and professionally and arrive at a watertight contract that delivers good value for both the business and the supplier in order to create a fruitful, long-term relationship. Where services are retained in-house, the appropriate location(s) should be surveyed for suitability, taking into consideration tax impacts of different countries.

Ignoring a detailed methodology to support a location decision, which must be associated with a tax impact assessment and business case, can result in the company not achieving its promised savings or quality of services.

Most analysis performed by finance or strategy departments in mining organizations tend to ignore the tax aspect, which can impact costs of up to 42 percent in specific cases.

Those organizations that master this long and difficult transition demonstrate strong skills and experience in change management, governance and talent management.

Frameworks and tools service management and design



Source: KPMG International 2013

Sizing the benefits

Although the prime driver behind shared services tends to be cost, mining organizations also gain a number of important additional business benefits.

Consolidation cuts the costs of buildings, telecommunication and IT networks, call center hardware and software and data storage. And with fewer total staff, often based in lower cost locations, people costs are also significantly reduced.

Centralized procurement brings economies of scale in the purchase of a wide range of services and equipment, including labor, tires, trucks and maintenance contracts. Asset management can also be delivered through shared services, providing greater knowledge of the global equipment estate, which should lead to

better utilization and lower costs. Given the high energy usage in mines, energy management could also be consolidated to gain greater control over usage and optimize buying power across different mines.

By standardizing and automating the processes through which services are delivered and centralizing the service centers, customers have a single point of contact for any queries, creating a consistent experience where problems and issues are resolved quickly. Activities such as payroll can even be moved to 'self-service', where staff view their details online, all of which increases employee satisfaction, which improves productivity and reduces attrition.

Within the centers themselves, the enhanced status and more challenging nature of the work will enable

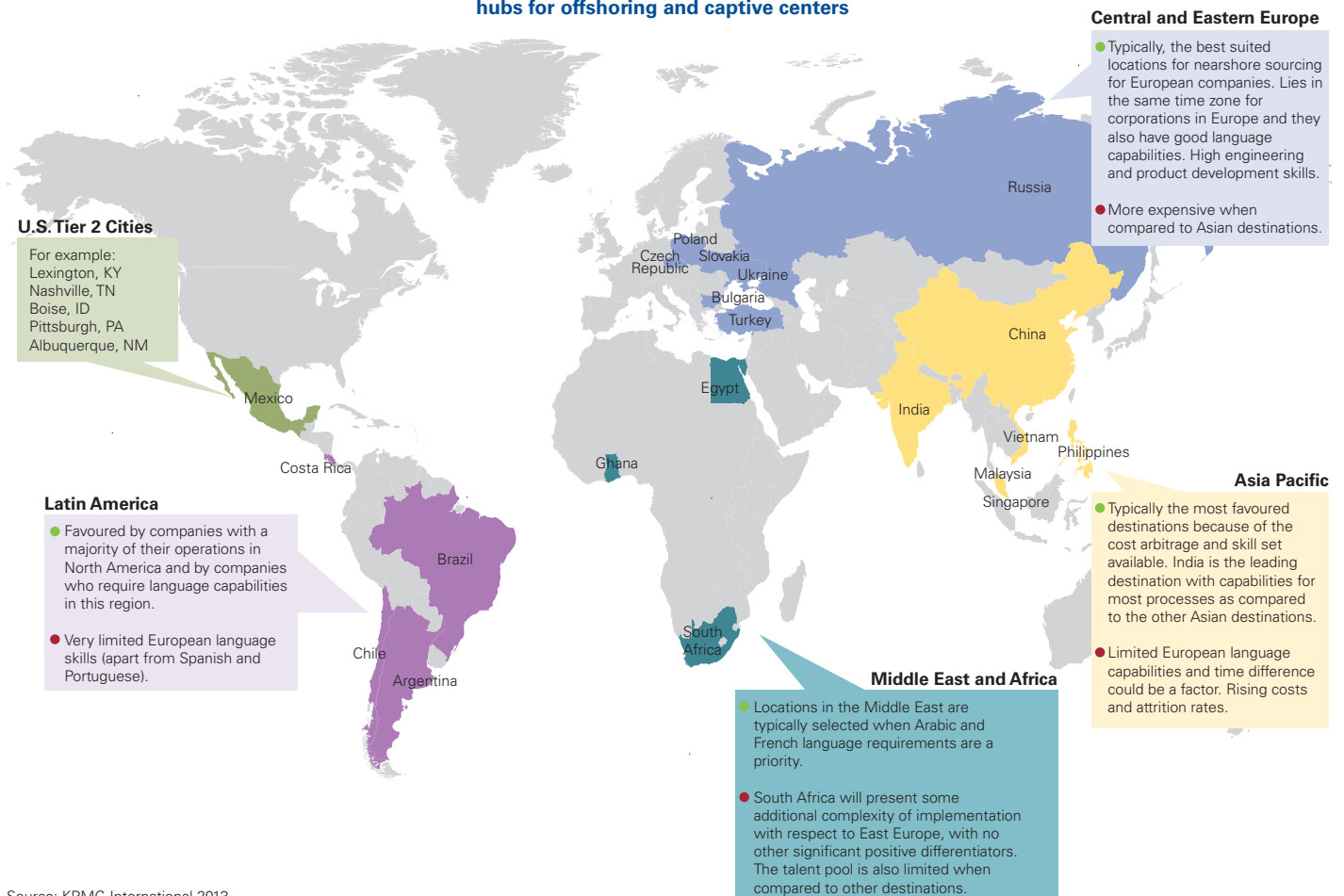
management to attract and retain the most appropriate people possessing both operational and commercial skills. And by introducing professional, cross-functional process management practices and sharing expertise, a culture of continuous improvement (such as Six Sigma) will emerge, ensuring more innovative ways to serve the business.

Through its independence, the shared services organization is better positioned to adapt to changes such as acquisitions and disposals.

Management will benefit from far more accurate and up-to-date information on employees, financial planning, IT costs and procurement efficiency, enabling it to make informed decisions and benchmark the company against best practices of competitors.

Globalization is a lever in driving value from a shared service strategy Top global locations

There are several locations which are now established hubs for offshoring and captive centers



Source: KPMG International 2013

An informed, independent view

Since its acquisition of EquaTerra, KPMG is now the world's largest outsourcing advisor and has been ranked number one in the list of the world's best outsourcing advisors for the past 4 years by the International Association of Outsourcing Professionals, the global, standard-setting organization. With more than 500 experienced professionals, we take time to really understand clients' business strategy before looking at how their support functions can help achieve their goals.

We have a proven sourcing and shared services methodology that covers all angles of the sourcing life cycle, including change management, tax, regulation, risk, project management and controls. And because we are fully independent and do not provide outsourced services, clients can be assured that our advice is objective and in their best interests, with no vendor preferences.

Operating model: a blueprint to deliver the corporate strategy

An effective operating model is a blueprint that outlines how operational units and departments can deliver the corporate strategy. Driving forward the model gives mining companies the flexibility to adapt to changing market conditions, along with a more permanent, low-cost culture dedicated to service quality.



Dorothy Nel
Management Consulting
KPMG in South Africa
T: +27 82 718 8581
E: dorothy.nel@kpmg.co.za

The boom years of rising commodity prices were inevitably accompanied by rising costs across the business as management strived to maximize production levels with less emphasis on efficiency. In recent times, companies have been keen to cut costs, yet many of these efforts have been relatively short-term initiatives such as indiscriminately slashing numbers in back office units and reining back expenditures on discretionary items such as marketing and advertising, all of which have a tendency to creep back in once better

economic conditions return. A more sustainable approach to cost efficiency is to ensure that the company's operating model is driving forward both the strategy and operational efficiency.

An operating model is broader than just the organizational structure. It is a comprehensive understanding of the entire business operation, ensuring that a mining company utilizes its resources and its relationships efficiently to achieve its strategic goals. These strategic goals could take many forms, such as



growth through acquisition, flexibility to increase or decrease output swiftly as demand fluctuates or cost leadership. Having clarified the vision, the company's leadership then needs to consider potential operating models that could best achieve these ambitions, which may involve more or less centralization and consolidation, shared services and/or outsourcing, changes to governance and a greater focus on workforce planning.

An effective operating model seeks to create a permanently lower-cost organization through more efficient and effective use of resources and better planning and time management, with every decision designed to support the overall corporate strategy. Reporting lines and accountability will be clearer, with a refreshed emphasis upon customer service.

The power of consolidation

Within an operating model, a wide range of functions can be centralized on a global or regional basis to use resources more effectively. When reviewing their talent, mining companies often find scarcities of certain skills including surveying, rock engineering and ventilation engineering. Some sites may have a dearth of such specialists while others have a surplus, with people sitting idle at times. By pooling these people centrally, individuals or groups can be more efficiently deployed across different sites as needed.

The functions that can potentially be moved to a shared services environment include HR, finance, procurement, IT,

“The functions that can potentially be moved to a shared services environment include HR, finance, procurement, IT, project management, security, facilities management and accommodation.”

project management, security, facilities management and accommodation. This reduces duplication and can cut head count and office space dramatically, cutting costs while improving levels of service through tightly monitored performance targets. Shared services also support other strategic goals, such as growth through acquisition, as the organization can more easily integrate new parts of the group, with the centralized hubs able to serve new internal 'customers'.

One example of shared services is plant and fleet, enabling a single owner to

look across demand for trucks, cranes and diggers across a number of sites and move the equipment to where it is most needed to minimize any redundant pieces and avoid shortages that could halt the extraction process.

Outsourcing is an alternative way to improve the operating model, with certain shared services being contracted out, reducing costs further and creating an extra level of flexibility, giving the capacity to increase or decrease volume in markets where demand is volatile.

Our overall approach to developing the target operating model (TOM)



Source: KPMG International 2013

“Implementing a new model as quickly as possible is vital, with a 12- to 18-month target preferable to avoid getting mired in a long change program that could potentially lose momentum.”

Designing the 'target' operating model

In designing a desired, or 'target' operating model, the location of the business will determine the nature of the supply chain. For companies operating in hostile or remote environments, the logistics of getting all the appropriate people and equipment to the mines is a huge challenge, so the operation must be geared to securing equipment, energy, people and other resources.

Implementing a new model as quickly as possible is vital, with a 12- to 18-month target preferable to avoid getting mired in a long change program that could potentially lose momentum. Leadership must be fully behind the transition, which should be communicated clearly across the organization, with ongoing key performance indicators (KPIs) that indicate progress against plans, with incentives linked to the achievement of major corporate goals.

KPMG's professionals are immensely experienced in designing and implementing operating models for mining companies and across a wide range of other sectors. We are very aware that strategy comes before structure and take the time to help clients clarify their goals before working out how to arrange the business's resources to best meet these objectives. This could include important decisions, such as whether to own or outsource plant and fleet and back-office functions or whether to operate as mines, as regional units or as separate, independent businesses. By improving productivity with fewer resources, our models give long-term gains in the form of a permanently lower cost base.



Information management: understanding what drives cost

Information management enables mining companies to consolidate operations data and use this knowledge to improve performance. By standardizing the way data is collected and aggregated from mining, processing and business systems, there is less use of spreadsheets, leading to greater accuracy and reliability, giving a tighter grip over process and cost variability.



Gerhard van Niekerk

Advisory Services
KPMG in the US
T: +1 713 319 2923
E: gvanniekerk@kpmg.com

Treating data as a valuable asset

Mining companies aim to be as low as possible on the cost curve to gain a buffer of protection should commodity prices drop. From an operational perspective, this means achieving the optimal flow of ore from the coal face through the port and to the customer at the lowest possible cost. Given the high unit costs of mining's capital intensive operations, even small, repetitive delays create significant lost opportunities that cut into the bottom line.

For example, a shovel waiting due to a lack of trucks, or a truck idling in a queue ahead of a shovel both indicate inefficiencies that will postpone production. Process water being pumped around in the reticulation system has a similar impact, adding cost with no end product to show for it. By making such waste visible, leaders can see the enormous benefit of small

gains. An additional productive minute per shift or a kiloliter less water pumped per minute could translate into yearly savings of millions of dollars. Certain fixed costs also demand attention, although these tend to relate to organizational and plant flow designs, so are less of a short-term management imperative.

Despite the growing volumes of information available to mining business teams, a lack of data quality hinders the ability to identify any inefficiencies. In-pit or underground systems have the potential to track the movements and productivity of all equipment and materials across a mine – and even on the rock faces – to monitor truck speeds, quality of minerals extracted, fuel efficiency, idle time and other key measures. Consequently, innovative mining companies are seeking greater insight by consolidating data that drives value to help gain greater short-term interval control over their operations. This means treating data as a priceless asset.

The lower part of the following diagram illustrates how operational costs can be optimized through a focus on control, so long as the activities that drive the costs are captured accurately, to identify the rate of cost per activity. Each of the value chain steps has value drivers that need to be managed.

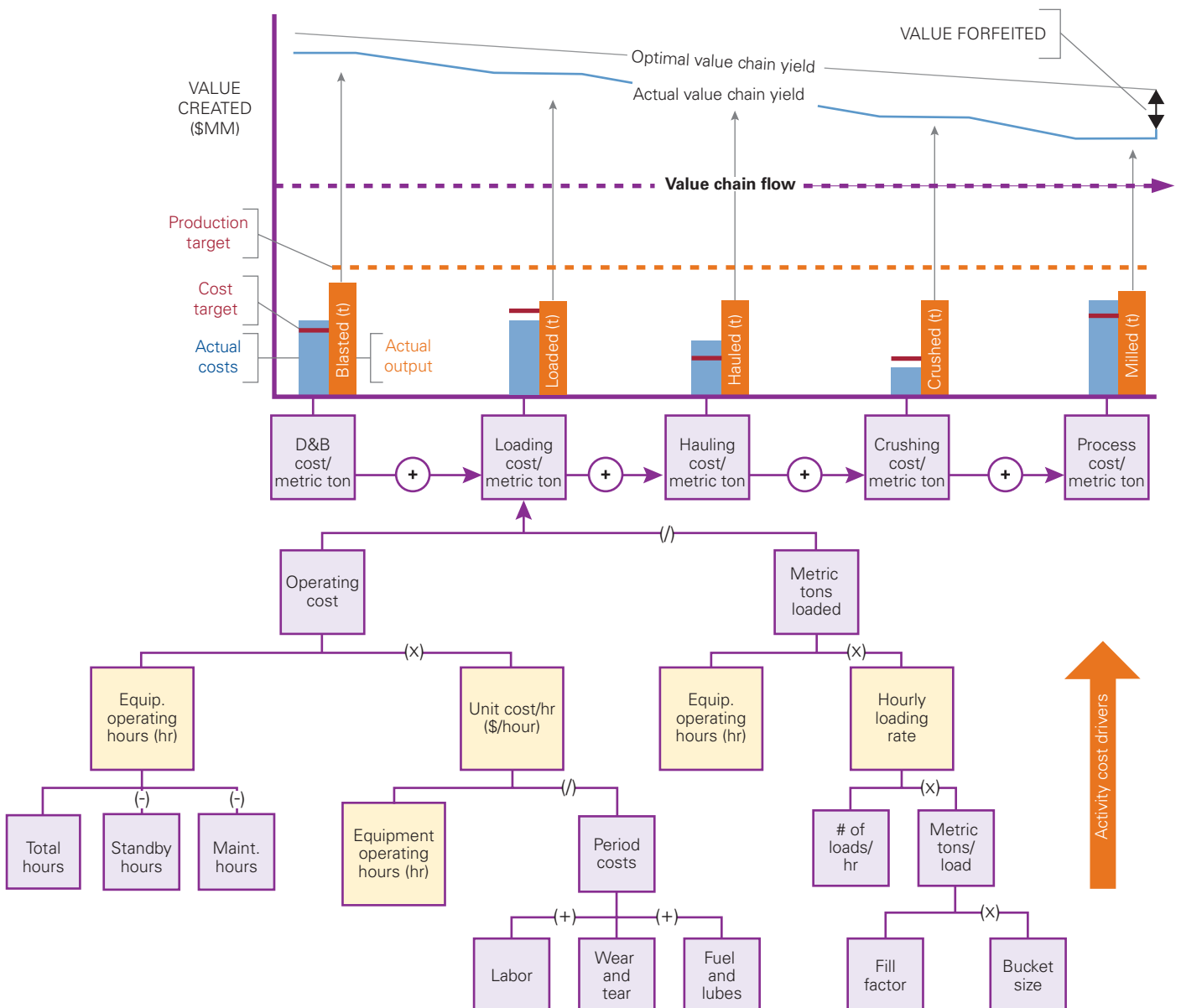
The upper half of the diagram shows how, across the value chain, variable

operating costs and fluctuating production output erode the yield from the ore to the products.

Companies are now building comprehensive integrated value driver models to collate data into the context provided by such a single model. An integrated model supports value chain analytics, root cause analysis, KPI reporting as well as budgeting support.

“Costs that get measured get managed... so long as they are visible”

Using information to create value



Source: KPMG International 2013

“Insightful information is the ‘language’ that aligns people around processes using information systems.”

Without full systems integration, companies are finding it hard to aggregate their data from systems around the site, causing a proliferation of spreadsheets (which remain the industry standard). Although spreadsheets allow for last-minute changes before meetings, they produce unreliable analytics and compromise data integrity. They also consume huge amounts of labor that could be better devoted to more productive activities.

The lengthy and often costly annual planning and budgeting process is a prime example of manual data gathering and manipulation, where operating forecasts are (re)produced for production, labor, consumables

and prices. The result is a static set of budgets and plans that cannot adapt to changing targets to meet operational realities.

In spite of strong evidence, many mining companies have not chosen to integrate their systems, due to insufficient leadership commitment and the absence of a roadmap centered on true business value. IT teams responsible for integration have the technical skills, but typically lack the business understanding to make it happen. In practice, an emphasis on short-term fixes take priority over systems projects and upgrades, so senior management need to drive change by collaborating with IT – rather than vice versa.



The road to cost leadership

In order to remain on the lower part of the cost curve, organizations should realize that the adoption of leading cost practices, the enablement of people and the integration of systems is a journey — not a project. Insightful information is the 'language' that aligns people around processes using information systems. There is a new interest in building out a reporting model starting top-down from the company business goals to its performance drivers. It is much faster to do than IT-driven approaches, creates insightful reports and gives leadership the insight to manage.

The KPMG mining team works with most of the world's major mining groups across a full range of mines and materials. We specialize in redesigning processes to fit clients' information needs. We can help consolidate systems to provide better support and integrate and standardize data from different sources. By reviewing the sources and flow of data from around the mine and speaking with (and training) the people responsible for entering and using the data, we can give management better information, which will help identify cost savings and efficiencies.

What makes the KPMG team stand out is our willingness to immerse ourselves fully in clients' operating teams for as long as they need coaching and support. Such a shared vision of value can give extra momentum in the bid to become a leading cost performer.



Cost culture: one eye on the margin



Jonathan Smith
Management Consulting
KPMG in Australia
T: +61 8 9263 4895
E: jesmith1@kpmg.com.au

By giving all staff a greater understanding of the consequences of cost decisions, mine owners should create an organization full of cost crusaders and end the cycle of rising costs.

In a recent KPMG survey¹ of senior executives from a range of sectors, the vast majority felt that cost reductions made during the recession were not sustainable, with costs quickly creeping back into the business as companies' attention turned back to growth. In the same piece of research, almost half of the respondents said they did not have a clear enough view of their cost base to make sustainable cost-efficiency decisions.

These challenges go right to the heart of attitudes to cost in a volatile, capital-intensive industry such as mining, where completing the project on time is the overarching priority. In the build phase of the project, all eyes are on key milestones and capital expenditure, with operational costs constituting a small proportion of the total.

At this point, it is all too easy to dismiss costs related to overall head count and underestimate the impact of support functions such as IT, human resources (HR), finance and supply chain on future operations costs. If these costs are not identified and tracked against the life cycle of the project build, the returns from the mine may be considerably lower than forecasted once production begins.

¹ The Cost Boomerang: How organisations can embed sustainable cost efficiency to drive competitive advantage, KPMG survey, 2011.





“Procuring the cheapest items does not always lead to the best value.”

In another example of poor cost-consciousness, well-negotiated procurement contracts may exceed budget because front line staff allow suppliers to raise variations and build in additional charges, claiming that the scope of the project has widened. Without the support and knowledge of the procurement team, staff are unaware of the negative effect of their concessions and, as a result of insufficient contract management skills, value can leak throughout the term of the contract.

In both of these cases, the organization can lose sight of its overall cost effectiveness due to dispersed responsibility for operating expenditure and an absence of key metrics that track and predict financial performance.

Supervisors and operational staff are typically less cost-aware than senior management and middle managers and many employees do not feel empowered to impact the company's cost performance, as they do not have the proper tools, skills or training.

Building awareness of cost

The return of cost is not inevitable. By encouraging employees to contribute towards active cost management, mining companies can create better cost management practices and increased commercial engagement among all

employees. The successful way that the industry has significantly changed its safety culture demonstrates the benefits of long-term transformation initiatives.

The first step is to highlight where value can be created and destroyed and to



ensure that staff understand the impact upon the value chain when making critical decisions.

Procuring the cheapest items does not always lead to the best value. In one case, a mine required a hydraulic ramp for a marine off-take facility (MOF). Although the purchasing team initially saved a few million dollars by choosing the lowest cost ramp, this equipment created bottlenecks in the process as it could not be used during low tide. A smarter, more informed outlook on the true cost of the purchase would have increased productivity to levels that far exceeded initial savings.

Embedding finance professionals in the project on-site – rather than at head office – can facilitate greater cost-consciousness. Analysts and management accountants in particular can help those on the front line gain

a better view of what is driving costs, which costs are in their control and which costs create value.

Although people should be accountable for cost management, they cannot achieve this successfully without the support of the right systems and processes. Systems must be set up to provide relevant and accurate cost management information, while financial reporting must be consistent and truly reflect business performance.

Cost performance commitments should be closely linked to results and aligned with people's incentives and current leading practice argues cost management should be part of the performance measures of cost center managers. Ultimately, the organization also needs the courage to stop projects or spend that are not consistent with strategy.

Checking your cost barometer

By helping mining companies gauge attitudes and behavior towards cost, KPMG firms can set them on the path to change. Our Commercial Engagement Index captures how employees feel about issues such as ownership of and accountability for cost, clarity of cost goals across the business, skills in cost management and ability and willingness to change. By understanding these factors, clients can create an organization where everybody thinks about cost on a daily basis and considers the wider cost-benefits of their decisions.



KPMG's Global Mining practice

KPMG Global Mining Centers

KPMG member firms offer global connectivity through our 14 dedicated Mining Centers in key locations around the world. By working together seamlessly, we help member firm clients adapt and respond to a rapidly-evolving mining environment.

Our centers are located in or near areas with high levels of mining activity: Beijing, Brisbane, Denver, Johannesburg, London, Melbourne, Moscow, Mumbai, Perth, Rio de Janeiro, Santiago, Singapore, Toronto, and Vancouver.

Each center is composed of professionals with extensive practical experience in the mining industry who work together to share information, thought leadership, training, and support. As a client, you will get access to the latest industry thinking, skills, resources, and technical development from a team that has local knowledge, backed up by in-depth global expertise. Our firms are continually building our understanding of global trends and developments by sharing observations and insights with you.

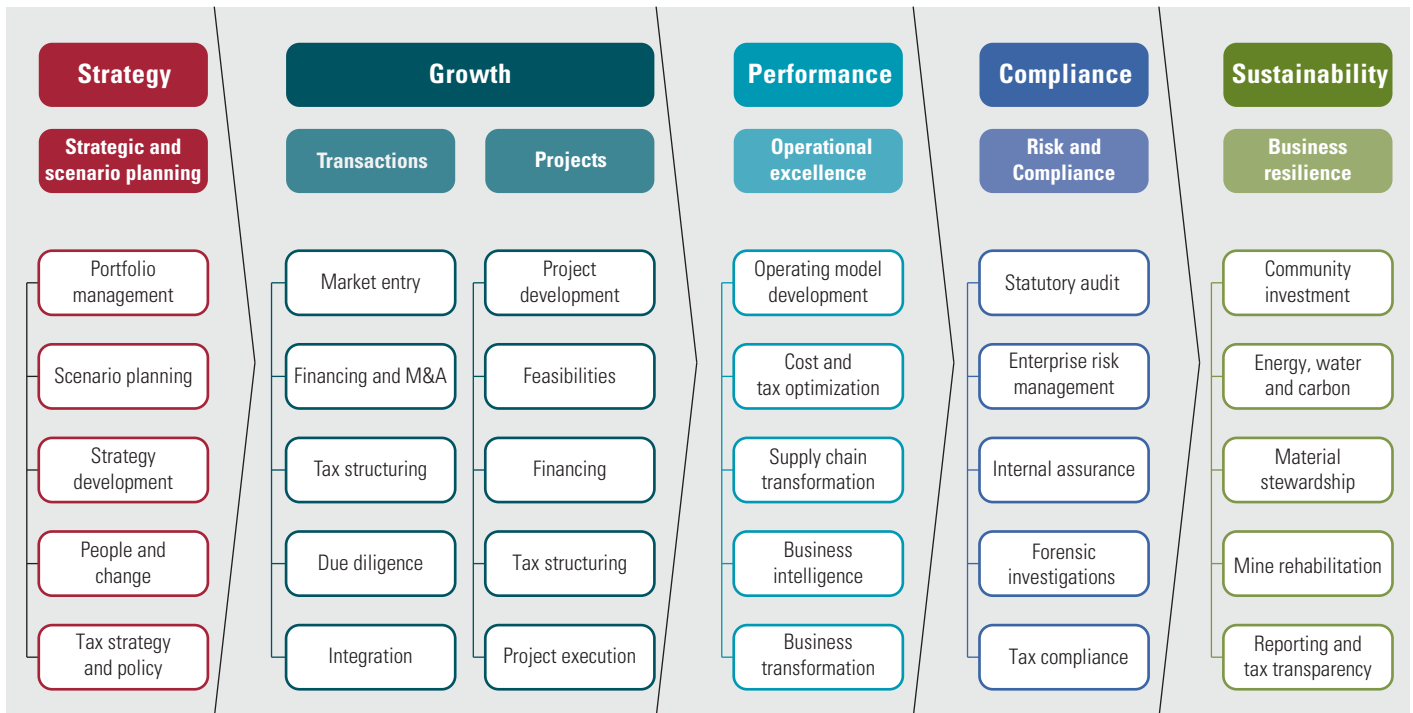
For more information, visit kpmg.com/mining



KPMG mining growth service offerings



Your asset life cycle – How KPMG firms can help



Source: KPMG International 2012

¹Estimated duration of stage in the mining asset life cycle

KPMG Mining Contacts

Mining Leadership Contacts

Michiel Soeting
Global Chair, Energy &
Natural Resources
T: +44 20 7311 1000
E: michiel.soeting@kpmg.co.uk

Darice Henritze
Global Mining Leader – Tax
T: +1 303 382 7019
E: dhenritze@kpmg.com

Hiran Bhadra
Global Mining Leader –
Operational Excellence
T: +1 214 840 2291
E: hbhadra@kpmg.com

Dane Ashe
Global Mining Leader –
Internal Assurance
T: +27 828 284 812
E: dane.ashe@kpmg.co.za

Jimmy Daboo
Global Head of Mining
T: +44 20 73118350
E: jimmy.daboo@kpmg.co.uk

Gary Webster
Global Mining Leader –
Projects
T: +1 604 646 6367
E: gwebster@kpmg.ca

Lee Hodgkinson
Global Mining Leader –
External Assurance
T: +1 416 777 3414
E: lhodgkinson@kpmg.ca

Rohitesh Dhawan
Global Mining Leader –
Sustainability
T: +27 827 196 114
E: rohitesh.dhawan@kpmg.co.za

Country Contacts

Carl Adams
KPMG Australia
T: +61 8 9263 7780
E: carladams@kpmg.com.au

Alejandro Cerda
KPMG in Chile
T: +56 2279 81501
E: acerda@kpmg.com

Anthony Crasto
KPMG in India
T: +91 22 3090 1976
E: acrasto@kpmg.com

Jacques Erasmus
KPMG in South Africa
T: +27 827 190 305
E: jacques.erasmus@kpmg.co.za

Martiniano Lopez
KPMG in Brazil
T: +55 112 183 3101
E: martinianolopes@kpmg.com.br

Melvin Guen
KPMG China
T: +86 10 8508 7019
E: melvin.guen@kpmg.com

Lydia Petrashova
KPMG in Russia
T: +7 49 5937 2975
E: lydiapetrashova@kpmg.ru

Bob Seale
KPMG in the UK
T: +44 20 73112025
E: bob.seale@kpmg.co.uk

Lee Hodgkinson
KPMG in Canada
T: +1 416 777 3414
E: lhodgkinson@kpmg.ca

Alexis Majnoni d'Intignano
KPMG in Francophone
Africa (Gabon)
T: +24 10 406 0806
E: amajnoni@kpmg.com

Hak Bin Pek
KPMG in Singapore
T: +65 6411 8138
E: pekhhb@kpmg.com.sg

Hiran Bhadra
KPMG in the US
T: +1 214 840 2291
E: hbhadra@kpmg.com

Authors

Bidyut Chakraborty
Management Consulting
KPMG in India
T: +91 33 4403 4068
E: bidyutchakraborty@kpmg.com

Harmeet Katari
Management Consulting
KPMG in South Africa
T: +27 11 647 7111
E: harmeet.katari@kpmg.co.za

Fabiano Lopes
Management Consulting
KPMG in the US
T: +1 214 840 6419
E: flopes@kpmg.com

Gerhard van Niekerk
Advisory Services
KPMG in the US
T: +1 713 319 2923
E: gvanniekerk@kpmg.com

Jon Richards
Strategy Group
KPMG in the UK
T: +44 20 7311 3353
E: jon.richards@kpmg.co.uk

Chris Van Der Merwe
Management Consulting
KPMG in South Africa
T: +27 82 718 3579
E: chris.vandermerwe@kpmg.co.za

Dorothy Nel
Management Consulting
KPMG in South Africa
T: +27 82 718 8581
E: dorothy.nel@kpmg.co.za

Jonathan Smith
Management Consulting
KPMG in Australia
T: +61 8 9263 4895
E: jesmith1@kpmg.com.au

Niladri Bhattacharjee
Management Consulting
KPMG in India
T: +91 33 4403 4020
E: niladri@kpmg.com

For a list of upcoming webcasts, recent thought leadership and our KPMG mining specialists, please visit kpmg.com/mining

kpmg.com/socialmedia



kpmg.com/app



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2013 KPMG International Cooperative ("KPMG International"), a Swiss entity. Member firms of the KPMG network of independent firms are affiliated with KPMG International. KPMG International provides no client services. No member firm has any authority to obligate or bind KPMG International or any other member firm vis-à-vis third parties, nor does KPMG International have any such authority to obligate or bind any member firm. All rights reserved.

The KPMG name, logo and "cutting through complexity" are registered trademarks or trademarks of KPMG International.

Designed by Evalueserve.

Publication name: From volume to value: Cost optimization in the mining sector

Publication number: 130406 | Publication date: August 2013